

CLAIMS

What is claimed is:

1. A seal assembly for sealing a toner passage in a toner hopper used in an image forming apparatus, said seal assembly comprising:

5 a main body portion, said main body portion including a first layer defining a first opening,

10 an adherent layer including a second opening in register with said first opening of said first layer, said adherent layer having a first surface and a second surface, said second surface of adherent layer is adjacent said first layer and said first surface of said adherent layer further including at least one masking region, whereby said masking region is covered by a kiss-cut release liner; and

15 a tear-able layer wherein said tear-able layer is adhered to said first surface of said adherent layer except where said masking region is covered by said kiss-cut release liner, thereby said kiss-cut release liner is covered by said tear-able layer; and

a pull-strip is connected to said tear-able layer.

2. A seal assembly as in claim 1 wherein said adherent layer comprises an adhesive material.

20 3. A seal assembly as in claim 1 wherein said adherent layer comprises a tape material whereby said tape material includes adhesive on two opposite surfaces.

25 4. A seal assembly as in claim 3 wherein said tape material includes a carrier in between two layers of glue or adhesive.

5. A seal assembly as in claim 1 wherein said adherent layer comprises a glue material.

5. A seal assembly as in claim 1 wherein said at least one kiss-cut is a precision cut that cuts fully through said release liner layer but not fully through said seal assembly.

5 7. A seal assembly as in claim 1 whereby said pull-strip comprises a strip of tear-able material which is unitary with said layer of tear-able material.

8. A seal assembly as in claim 1 whereby said pull-strip comprises a tear-guide.

10 9. A seal assembly as in claim 1 wherein a connecting region is formed in the vicinity where said pull-strip connects to said tear-able layer; and

15 whereby a first pre-cut and a second pre-cut are proximately located in said connecting region or adjacent said connecting region, said first and second pre-cuts determining a location of an initial tear of said tear-able layer in said main body portion.

20 10. A seal assembly as in claim 1 whereby a tape layer is located on a second surface of said first layer and a second release liner layer is attached to said second surface of said tear-able layer to protect said tape layer prior to installing said seal assembly and which is removed prior to installing said seal assembly.

25 11. A seal assembly as in claim 1 whereby said masking portion of said layer of said kiss-cut release liner includes more than one discrete region on said kiss-cut release liner.

12. A seal assembly as in claim 1 whereby said non-masking portion of said layer of said kiss-cut release liner includes more than one discrete region on said kiss-cut release liner.

13. A seal assembly as in claim 1 whereby said tear-able layer is conductive.

14. A seal assembly as in claim 1 whereby said pull-strip layer is conductive.

5 15. A toner hopper used in an image forming apparatus;

whereby said toner hopper includes a reservoir and a feed roller compartment;

and

whereby said reservoir is used to store powdered toner; and

whereby said feed roller compartment includes a roller used to dispense toner;

10 and

whereby said toner hopper includes a seal assembly between said reservoir and said feed roller compartment;

said seal assembly comprising:

15 a main body portion, said main body portion including a first layer defining a first opening,

20 an adherent layer including a second opening in register with said first opening of said first layer, said adherent layer having a first surface and a second surface, said second surface of said adherent layer is adjacent said first layer and said first surface of said adherent layer further including at least one masking region, whereby said masking region is covered by a kiss-cut release liner; and

a tear-able layer wherein said tear-able layer is adhered to said first surface of said adherent layer except where said masking region is covered by said kiss-cut release liner, thereby said kiss-cut release liner is covered by said tear-able layer; and

25 a pull-strip is connected to said tear-able layer.

16. A toner cartridge assembly used in an image forming apparatus; whereby said toner cartridge assembly includes of a toner hopper and a waste toner hopper; and whereby said waste toner hopper includes of a photoreceptor, a cleaning blade, a charging device for electrostatically charging said photoreceptor and a container to receive waste toner; and whereby said toner hopper includes a reservoir and a feed roller compartment; and whereby said reservoir is used to store powdered toner; and whereby said feed roller compartment has a roller used to dispense toner; and whereby said toner hopper includes a seal assembly; and
- 10 said seal assembly comprising:
- a main body portion, said main body portion including a first layer defining a first opening,
- 15 an adherent layer including a second opening in register with said first opening of said first layer, said adherent layer having a first surface and a second surface, said second surface of said adherent layer is adjacent said first layer and said first surface of said adherent layer further including at least one masking region, whereby said masking region is covered by a kiss-cut release liner; and
- 20 a tear-able layer wherein said tear-able layer is adhered to said first surface of said adherent layer except where said masking region is covered by said kiss-cut release liner, thereby said kiss-cut release liner is covered by said tear-able layer; and
- a pull-strip is connected to said tear-able layer.
- 25 17. A toner cartridge assembly as in claim 16 wherein said adherent layer comprises an adhesive material.

18. A toner cartridge assembly as in claim 16 wherein said adherent layer comprises a tape material whereby said tape material includes adhesive on two opposite surfaces.
- 5 19. A toner cartridge assembly as in claim 18 wherein said tape material includes a carrier in between two layers of glue or adhesive.
20. A toner cartridge assembly as in claim 16 wherein said adherent layer comprises a glue material.
- 10 21. A toner cartridge assembly as in claim 16 wherein said at least one kiss-cut is a precision cut that cuts fully through said release liner layer but not fully through said seal assembly.
- 15 22. A toner cartridge assembly as in claim 16 whereby said pull-strip comprises a strip of tear-able material which is unitary with said layer of tear-able material.
- 20 23. A toner cartridge assembly as in claim 16 whereby said pull-strip comprises a tear-guide.
- 25 24. A toner cartridge assembly as in claim 16 wherein a connecting region is formed in the vicinity where said pull-strip connects to said tear-able layer; and whereby a first pre-cut and a second pre-cut are proximately located in said connecting region or adjacent said connecting region, said first and second pre-cuts determining a location of an initial tear of said tear-able layer in said main body portion.

25. A toner cartridge assembly as in claim 16 whereby a tape layer is located on a second surface of said tear-able layer and a second release liner layer is attached to said second surface of said tear-able layer to protect said tape layer prior to installing said seal assembly and which is removed prior to installing said seal assembly.

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26. A toner cartridge assembly as in claim 16 whereby said masking portion of said layer of said kiss-cut release liner includes more than one discrete region on said kiss-cut release liner.

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27. A toner cartridge assembly as in claim 16 whereby said non-masking portion of said kiss-cut release liner includes more than one discrete region on said kiss-cut release liner.

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28. A toner cartridge assembly as in claim 16 whereby said tear-able layer is conductive.

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29. A toner cartridge assembly as in claim 16 whereby said pull-strip layer is conductive.

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30. An image forming apparatus;
whereby said image forming apparatus contains a toner storage container, a waste toner hopper, a photoreceptor, a cleaning blade, a fuser section, a photoreceptor charging device and a transfer section;
whereby said toner storage container has a storage tank; and
whereby said storage tank includes a seal assembly; and
said seal assembly comprising:

a main body portion, said main body portion including a first layer defining a first opening,

an adherent layer including a second opening in register with said first opening of said first layer, said adherent layer having a first surface and a second surface, said second surface of said adherent layer is adjacent said first layer and said first surface of said adherent layer further including at least one masking region, whereby said masking region is covered by a kiss-cut release liner; and

5 a tear-able layer wherein said tear-able layer is adhered to said first surface of said adherent layer except where said masking region is covered by said kiss-cut release liner, thereby said kiss-cut release liner is covered by said tear-able layer; and
10 a pull-strip is connected to said tear-able layer.

31. A method of forming a seal assembly for sealing a toner passage in a toner hopper used in an image forming apparatus by

15 adhering a release layer to the first surface of an adherent layer,

forming at least one kiss-cut in the release layer to generate a masking portion and a non-masking portion,

removing the non-masking portion of the release layer,

whereby the masking portion prevents a portion of a tearing layer from
20 adhering to the adherent layer ;

adhering a first layer to a second surface of the adherent layer; and

whereby there is a pull-strip attached to the assembly.

32. A method of forming a seal assembly for sealing a toner passage in a toner hopper used in an image forming apparatus comprising the steps of:

providing a main body portion including a first layer defining a first opening, an adherent layer including a second opening in register with the first opening of the first layer, the adherent layer having a first surface and a second surface, the first surface of adherent layer is adjacent the first layer and the second surface of the adherent layer is adjacent a release liner layer;

5 forming at least one kiss-cut fully through the release liner layer, wherein the kiss-cut separates the release liner layer into at least one masking portion and at least one non-masking portion;

10 removing the non-masking portion of release liner layer to generate an exposed portion of the adherent layer thereby further providing a non-exposed portion of the adherent layer under the masking portion of the release liner layer;

15 adhering a layer of tear-able material to the exposed portion of the adherent layer, wherein a pull-strip is attached to the layer of tear-able material.

33. A method of forming a toner hopper used in an image forming apparatus;

whereby the toner hopper includes a reservoir and a feed roller compartment; and

whereby the reservoir is used to store powdered toner; and

whereby the feed roller compartment includes a roller used to dispense toner;

20 and

whereby the toner hopper includes a seal assembly between the reservoir and said feed roller compartment;

said method includes forming a seal assembly including the following steps;

25 adhering a release layer to the first surface of an adherent layer,

forming at least one kiss-cut in the release layer to generate a masking portion and a non-masking portion;

removing the non-masking portion of the release layer,

whereby the masking portion prevents a portion of a tearing layer from
adhering to the adherent layer;

adhering a first layer to a second surface of the adherent layer; and

whereby there is a pull-strip attached to the assembly.

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34. A method of forming a toner hopper used in an image forming apparatus;

whereby the toner hopper includes a reservoir and a feed roller compartment;

and

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whereby the reservoir is used to store powdered toner; and

whereby the feed roller compartment includes a roller used to dispense toner;

and

whereby the toner hopper includes a seal assembly between the reservoir and
said feed roller compartment;

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said method includes forming a seal assembly including the following steps;

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providing a main body portion including a first layer defining a first opening,
an adherent layer including a second opening in register with the first opening of the
first layer, the adherent layer having a first surface and a second surface, the first
surface of adherent layer is adjacent the first layer and the second surface of the
adherent layer is adjacent a release liner layer;

forming at least one kiss-cut fully through the release liner layer, wherein the
kiss-cut separates the release liner layer into at least one masking portion and at least
one non-masking portion;

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removing the non-masking portion of release liner layer to generate an exposed
portion of the adherent layer thereby further providing a non-exposed portion of the
adherent layer under the masking portion of the release liner layer;

adhering a layer of tear-able material to the exposed portion of the adherent layer, wherein a pull-strip is attached to the layer of tear-able material.

- 5 35. A method of forming a toner cartridge assembly used in an image forming apparatus;
- whereby the toner cartridge assembly includes of a toner hopper and a waste toner hopper; and
- whereby the waste toner hopper includes of a photoreceptor, a cleaning blade, a
- 10 charging device for electrostatically charging said photoreceptor and a container to receive waste toner; and
- whereby the toner hopper includes a reservoir and a feed roller compartment; and
- whereby the reservoir is used to store powdered toner; and
- whereby the feed roller compartment has a roller used to dispense toner; and
- 15 whereby the toner hopper includes a seal assembly for sealing the reservoir in the toner hopper; and
- whereby said method includes forming a seal assembly including the following steps;

adhering a release layer to the first surface of an adherent layer,

20 forming at least one kiss-cut in the release layer to generate a masking portion and a non-masking portion,

removing the non-masking portion of the release layer,

whereby the masking portion prevents a portion of a tearing layer from adhering to the adherent layer;

25 adhering a first layer to a second surface of the adherent layer; and

whereby there is a pull-strip attached to the assembly.

36. A method of forming a toner cartridge assembly used in an image forming apparatus;

whereby the toner cartridge assembly includes of a toner hopper and a waste toner hopper; and

5 whereby the waste toner hopper includes of a photoreceptor, a cleaning blade, a charging device for electrostatically charging said photoreceptor and a container to receive waste toner; and

whereby the toner hopper includes a reservoir and a feed roller compartment; and

whereby the reservoir is used to store powdered toner; and

10 whereby the feed roller compartment has a roller used to dispense toner; and

whereby the toner hopper includes a seal assembly for sealing the reservoir in the toner hopper; and

whereby said method includes forming a seal assembly including the following steps;

15 providing a main body portion including a first layer defining a first opening, an adherent layer including a second opening in register with the first opening of the first layer, the adherent layer having a first surface and a second surface, the first surface of adherent layer is adjacent the first layer and the second surface of the adherent layer is adjacent a release liner layer;

20 forming at least one kiss-cut fully through the release liner layer, wherein the kiss-cut separates the release liner layer into at least one masking portion and at least one non-masking portion;

removing the non-masking portion of release liner layer to generate an exposed portion of the adherent layer thereby further providing a non-exposed portion of the adherent layer under the masking portion of the release liner layer;

25 adhering a layer of tear-able material to the exposed portion of the adherent layer, wherein a pull-strip is attached to the layer of tear-able material.

37. A method of forming an image forming apparatus;

whereby the image forming apparatus contains a toner storage container, a waste toner hopper, a photoreceptor, a cleaning blade, a fuser section, a photoreceptor charging device and a transfer section;

5 whereby the toner storage container has a storage tank; and

whereby the storage tank includes a seal assembly for sealing a toner passage in the storage container; and

whereby said method includes forming the seal assembly including the following steps;

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adhering a release layer to the first surface of an adherent layer,

forming at least one kiss-cut in the release layer to generate a masking portion and a non-masking portion,

removing the non-masking portion of the release layer,

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whereby the masking portion prevents a portion of a tearing layer from adhering to the adherent layer;

adhering a first layer to a second surface of the adherent layer; and

whereby there is a pull-strip attached to the assembly.

20 38. A method of forming an image forming apparatus;

whereby the image forming apparatus contains a toner storage container, a waste toner hopper, a photoreceptor, a cleaning blade, a fuser section, a photoreceptor charging device and a transfer section;

whereby the toner storage container has a storage tank; and

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whereby the storage tank includes a seal assembly for sealing a toner passage in the storage container; and

whereby said method includes forming the seal assembly including the following steps;

5 providing a main body portion including a first layer defining a first opening, an adherent layer including a second opening in register with the first opening of the first layer, the adherent layer having a first surface and a second surface, the first surface of adherent layer is adjacent the first layer and the second surface of the adherent layer is adjacent a release liner layer;

10 forming at least one kiss-cut fully through the release liner layer, wherein the kiss-cut separates the release liner layer into at least one masking portion and at least one non-masking portion;

removing the non-masking portion of release liner layer to generate an exposed portion of the adherent layer thereby further providing a non-exposed portion of the adherent layer under the masking portion of the release liner layer;

15 adhering a layer of tear-able material to the exposed portion of the adherent layer, wherein a pull-strip is attached to the layer of tear-able material.

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